number of sea-fishes inhabiting both sides of the Isthmus, which Dr. Günther has shown to be absolutely identical. To these may be added several species of mollusca. With reference to the mollusca Mr. Wallace[1] observes, "The long-continued separation of North and South America by one or more arms of the sea . . . is further rendered necessary by the molluscan fauna of the Pacific shores of tropical America, which is much more closely allied to that of the Caribbean sea, and even of West Africa, than to that of the Pacific Islands. The families of many of the genera are the same, and a certain proportion of very closely allied or identical species, shows that the union of the two oceans continued late into tertiary times. If fishes and mollusca could thus pass from ocean to ocean, there is no doubt that algæ could also pass. Besides *Sarg. bacciferum*, *S. vulgare*, and *S. dentifolium*, the following species, among others, are common to both hemispheres, namely, *Chnoospora fastigiata*, *Hydroclathrus cancellatus*, *Digenia simplex*, *Acanthophora Thierri*, and others too numerous to mention. It is further thought that such plants are among the oldest forms of algæ, and that algæ are among the oldest productions of the vegetable world. Geologists are of opinion that the tropical passage between the Atlantic and Pacific was open during the tertiary and cretaceous epochs. How long a time has elapsed since this period is another question that remains to be answered. This can only be done approximately. "From the Devonian period, or earlier," says Prof. Huxley,[2] "to the present day, the four great oceans, Atlantic, Pacific, Indian, and Antarctic, may have occupied their present positions, and only the coasts and channels of communication have undergone an incessant alteration." Mr. Croll, who, in his most interesting work "Climate and Time," brings astronomical science to bear upon the elucidation of geological problems, states that "the great ocean basins are probably of immense antiquity; that the great depressions of the Atlantic, Pacific, and Indian Oceans may be as old as the Laurentian period for any thing which geology shows to the contrary." He also remarks—"all our main continents and islands not only existed during the glacial period as they do now; the very contour of the surface was much the same as at the present day."[3] The migration of *S. bacciferum* from one ocean to the other must then have taken place previously to the commencement of the glacial period—the most recent glacial period, I mean—for Mr. Croll thinks that there were other glacial periods with intermediate warm periods during the tertiary epoch. He gives astronomical reasons[4] for saying that the commencement of the most recent glacial epoch cannot date back more than 240,000 years. As, then, there has been no material alteration of the surface of the land since that period, and our plant now inhabits and can live in the warmer parts only of the three great oceans, the barriers to their intercommunication being now closed as before-mentioned, it follows that this alga must be at least of greater antiquity than the glacial period, 240,000 years ago. How many thousands or hundreds of thousands additional years may be added to its age, it is impossible to say. Perhaps on some slab of rock from the depths of the earth the astonished and admiring botanist may yet recognise a fossil plant of the wandering Sargassum.[5]

If the presence of a great number of species in a limited area is suggestive that the parent-stock may have originated in that locality, then it is probable that the primary habitat of the genus Sargassum may have been in the Indian and adjacent oceans, since it is on the southern coasts of Asia, the islands in the Indian Ocean, and round the coasts of Australia and New Zealand (Mr. Wallace's "Oriental and Australian Regions," also his "Ethiopian Regions," Nos. 1 and 4), that the greater number of species of Sargassum are found. No less than forty species are known to inhabit the seas around Australia and New Zealand.

There are fair grounds for the opinion that many of the tropical algæ of the three great oceans are probably among the oldest forms of this class of plants—*S. bacciferum* and its congener *S. vulgare*, also *S. dentifolium*, and other algæ before mentioned may, therefore, be "survivals," still existing in health and vigour, of the marine vegetation of a very remote period, as ancient, at least, as the miocene[6] epoch, when the appearance and configuration of the country was, in all probability, different from what it is at the present day.

One cannot but look with wonder and admiration mixed with somewhat of veneration, on the wandering Sargussum, still in vigorous existence, which has survived so many changes of climate affecting different parts of the earth's surface; so much variation in the boundaries of the sea-shores; before which the rise and fall of empires, and the very existence of man, form almost inappreciable items in its life-history.

In order to show the great numerical increase in the species of Sargassum in the warmer seas, I shall conclude this article with a tabular view of their geographical distribution. In the division of regions I have followed Mr. Wallace. It is to be observed that as some species range through more than one region, they are consequently entered in each region, and thus the aggregate of species appears to be greater than it really is.

	1. Palæarctic.				2. Ethiopian.				3. Oriental.				4. Australian.				5. Neotropical.				6. Nearctic.			
	North Europe.	Mediterranean.	Siberia.	Manchuria or Japan.	East Africa.	West Africa.	South Africa.	Madagascar.	Hindostan.	Ceylon.	Indo-China.	Malayan.	Austro-Malayan.	Australia.	Polynesia.	New Zealand.	Chili.	Brazil.	Mexico.	Antilles or West Indies.	California.	Rocky Mountains.	East United States.	Canada.
Number of regions.	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Number of species.	–	6	–	13	11	2	7	9	22	4	16	20	1	36	13	8	2	6	1	10	–	–	1	–

MARY P. MERRIFIELD

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

THE Master of Trinity College, Cambridge, has forwarded to the Vice-Chancellor certain statutes made by the College affecting the University, and in doing so intimates that the Colleges consider that the provisions of the Universities of Oxford and Cambridge Act, 1877, do not bind them to postpone their final adoption until one month after they have been communicated to the Council of the Senate. The statutes have reference to, among others, the Trinity Professorship of Physiology. They provide that any person hereafter elected to the Professorship shall be entitled to a Fellowship at Trinity unless he is Master or Fellow of some other College. The Trinity Professor of Physiology is to receive an annual stipend of 500*l.*, in addition to the emoluments of a Fellowship. The new statutes also provide that there shall be paid by the College to the University an annual sum calculated upon the amount of the distributable income of the College, which is particularly defined. Such annual sums to commence from the time the statutes come into operation, and shall be in the first instance equal to 5 per cent. of the distributable income, to be increased to $7\frac{1}{2}$ per cent. when the statutes have been ten years in operation, and to 10 per cent. when they have been fifteen years in operation. The provisions of these statutes with respect to the Trinity Professorship of Physiology shall take effect from and after the appointment of the first Trinity Professor of Physiology, under the provisions of a statute or statutes to be made with the consent of the College for the establishment of the said professorship.

THE French Government proposes to do an act of justice in raising the stipends of professors in science and medicine to the same amount as in the case of law and letters, 15,000 francs. Dr. Simplice, who writes on the subject in the *Union Médicale*, points out how unequally professors of pure science, as botany and chemistry, are rewarded as compared with, say, clinical professors, who can add enormously to their income by private

[1] "Geographical Distribution of Animals," vol. ii., p. 58.

[2] Address to the Geological Society, reported in the *Journal* of the Geological Society, May, 1870.

[3] "Climate and Time," p. 9. [4] *l.c.*, p. 355.

[5] Among the fossil algæ known to botanists are some specimens of Sargassum.

[6] Mr. J. S. Gardner, F.G.S., has recently expressed his opinion that the American continents became united during the eocene period (see NATURE, vol. xviii. p. 192). If this be the fact, a great addition must be made to the antiquity of these plants.

practice. Dr. Simplice proposes that a maximum salary should be given to the former, and a minimum to the latter. This is a subject that calls for consideration here as well as in France.

SOCIETIES AND ACADEMIES

Boston, U.S.A.

American Academy of Arts and Sciences, October 9.—Charles Francis Adams, president, in the chair.—Prof. W. A. Rogers read a paper on the limits of accuracy in measurements with the microscope, in which he stated that Prof. E. N. Morley and himself independently measured 195 spaces having a magnitude of about $\frac{1}{500}$ of an inch, each space, however, varying slightly from this value. The measures were made with a glass eye-piece micrometer, a Beck's spider line micrometer, and with a screw attached to the sub-stage of the microscope. After the results were prepared for the press they were for the first time compared. It was found that the average difference between the results for a single space was 32 millionths of an inch, and the greatest difference was 12 millionths. There were only four cases in which the difference amounted to one hundred thousandth of an inch.—In a second paper Prof. Rogers gave a determination of the errors of the sub-divisions of a copy of the British yard known as Bronze No. 11 and of the metre of the U.S. Bureau of Weights and Measures and the production therefrom of an inch, which is one thirty-sixth of this particular yard, and of a centimetre, which is one-hundredth part of this particular metre, the temperature in both cases being 67° F.—Prof. John Trowbridge described a new electro-dynamometer for measuring strong electric currents without shunting them. The principle consists in cooling the two points in the revolving axis of the instrument where the current enters and leaves by means of a current of water and in using mercury pivots. The instrument can measure from a fraction of a Weber up to six hundred Webers. It is especially adapted for the measurement of currents produced by dynamo-electric machines.

Göttingen

Royal Academy of Sciences, July 6.—The following papers were read:—On the solution of equations of the fifth degree, by L. Kiepert.—On *Duboisia myoporoides*, by W. Marmé.—Herr Hänselmann of Brunswick presented to the Academy the certified copies of eighty-two letters written by or addressed to Gauss.

August 3.—On the feldspar in the basalt of the Hohe Hagne, near Göttingen, and its relation to the feldspar from the Monte Gibele on the Island of Pantellaria.

Paris

Academy of Sciences, October 22.—M. Daubree in the chair.—The President announced the deaths of M. Bienaymé, free Academician, and M. Leymerie, correspondent in mineralogy.—M. Des Cloizeaux read a note on the works of the late M. Delafosse.—The following papers were read:—On the thermal formation of the combinations of oxide of carbon with other elements, by M. Berthelot. The heats liberated by chlorinised and sulphurised combinations of carbonic oxide are less than those of hydrogen: which corresponds to their less stability.—Various thermal determinations, by M. Berthelot. This relates to boric acid, chromate of soda, biacetate of soda, iodide of silicium, and earthy phosphates.—On the vision of colours, and especially on the influence exercised on vision of coloured objects in circular motion when observed comparatively with similar bodies in repose; extract from a small work by M. Chevreul. He supports the view of dyers and artists that there are three simple colours, viz., red, yellow, and blue. He finds, also, that by a motion having a maximum of 160 to 120 turns, and a minimum of sixty per minute, one may generate the complementary of every colour submitted to this movement.—On ytterbine, a new earth contained in gadolinite, by M. Marignac. The name is given to recall its presence in the mineral of Ytterby, also its similarity to yttria, on one hand, by absence of colour, and to erbine, on the other, by the elevation of its equivalent (say 131); to both, by the *ensemble* of its properties. The atomic weight deduced for ytterbium would be 115 or 172·5, according as its oxide receives the formula YbO or Yb_2O_3.—On the dentition of Smilodons, by M. Gervais.—The disease of chestnuts in the Cevennes, by M. Planchon. The gradual death of the stem and branches is caused by an alteration of the roots, which become softened with a sort of moist gangrene, giving out an exudati n of tannic nature. These phenomena are caused by the mycelium of a fungus. M. Planchon thinks untimely irrigations are the chief *occasional* cause of the evil.—Processes for determining the butter in milk; reply to note by M. Adam, by M. Marchand.—Complementary observations on formulæ relating to perforation of iron armour plates, by M. Martin de Brettes.—M. Ponti, of Milan, announced his intention to place 60,000 Italian pounds at the disposal of the Academy, for founding an annual prize.—Observations on a communication from M. Amigues on flattening of the planet Mars, by M. Hennedy. He confirms M. Amigues' calculations from independent researches.—Remarks on M. Levy's note regarding a universal law relative to dilatation of bodies, by M. Boltzmann. He finds in fluid water a contradiction of M. Levy's theorem (about the pressure of an inclosed heated body increasing rigorously with the temperature).—Note relative to the theorem on the composition of accelerations of any order, by M. Lignine.—On the rectification of the ovals of Descartes, by M. Darboux.—Second note on the resolution in whole numbers of the equation (1) $ax^4 + by^4 = cz^2$, by M. Desboves.—On the Mosandrum of Prof. L. Smith, by M. Delafontaine. He rejects Prof. Smith's claim of priority, and affirms the identity of mosandric acid and terbine.—Researches on sulphates, by M. Etard. This relates to rose ferroso-ferric sulphates, mixed proto-sulphates, and simple or double sulphates, more or less hydrated.—On the nerve terminations in striated muscle, by M. Tschiriew. He has found, in several species, new forms of nerve-termination, intermediate between the motor termination (as met with in the frog), and the terminal plates. The most simple is in the tortoise; nerve-fibres deprived of myeline, ramify without anastomosing, and terminate, on the muscular bundles, by rods, sometimes smooth, but oftener moniliform, or surrounded by grains. There are generally several such terminations on one muscular fibre.—On the albuminoid matters of organs and of the spleen in particular, by M. Picard. Globuline exists in the spleen independently of the presence of blood.—On the hydrophorous reservoirs of Dypsacus, by M. Barthelemy. He rejects M. Boyer's view that the water present is produced by secretion (principally) and by dew, and attributes the liquid entirely to rain.—Apparatus for experimenting on the action of electricity on living plants, by M. Celi. This consists of a bell-jar, into which electricity is admitted by a metallic collector, connected with an insulated metallic vessel at 2 m. height, from which streams a thin vein of water.—Influence of salicylic and thymic acid, and some essences on germination, by M. Haeckel. While phenic acid suspends germination, salicylic acid (even in very small quantity) stops it altogether.

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